Document details

‹ Back to results | 1 of 14 Next ›

Export Download Print E-mail Save to PDF Add to List More... ›

International Journal of Advanced Science and Technology
Volume 28, Issue 14, 9 November 2019, Pages 414-418

Design and control of a single phase synchronous inverter for microgrid (Article)

Motakabber, S.M.A., Ibrahimy, M.I., Rahman, T.

Department of Electrical and Computer Engineering, International Islamic University Malaysia, Kuala Lumpur, 53100, Malaysia

Abstract

View references (10)

Microgrid power system is becoming popular for utilizing renewable energy. This energy should invert to supply AC for microgrid , but inversion of the renewable energy has suffered some issues; inferior quality of waveform, large phase difference, high switching loss and poor power quality. A new scheme of phase synchronous inverter (PSI) has outline in the microgrid system which improve the quality of the power supply. A pulse width modulation (PWM) signal is generated for PSI to precisely synchronize with the grid line frequency. A lowpass LC filter is utilized to reduce the higher harmonics frequency in the inverter . In this research a resistive load of 40 Ω and input DC voltage ± 35 V has been considered. A PWM of 1600 Hz carrier frequency and 95% modulation index with 50 Hz fundamental frequency has been examined in this project. The simulated results show that the proposed PSI overall efficiency is 96%, total harmonic distortion (THD) is 3.9% and phase distortion is about 4 degrees. Therefore, it is highly appreciated that proposed design will improve the microgrid power supply system. © 2019 SERSC.

SciVal Topic Prominence

Topic: Electric inverters | Control | Uninterruptible power

Prominence percentile: 79.832

Author keywords

Inverter | Microgrid | Phase synchronization | Power quality | PWM | THD

Funding details

Funding sponsor	Funding number	Acronym
	FRGS15-190-0431	
	SF14-010-0060	

Funding text

This research has been supported by the Malaysian Ministry of Science and Technology through the eScienceFund under the project ID: SF14-010-0060 and the Malaysian Ministry of Education through the Fundamental Research Grant Scheme under the project ID: FRGS15-190-0431.

ISSN: 20054238
Source Type: Journal
Original language: English

Document Type: Article
Publisher: Science and Engineering Research Support Society

Computer and Communication Engineering, ICCCE 2018

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

References (10)

View in search results format >

All | Export | Print | E-mail | Save to PDF | Create bibliography

1 Rahman, T., Ibrahimy, M.I., Motakabber, S.M.A., Mostafa, M.G.
Simulation and evaluation of a phase synchronous inverter for micro-grid system

(2016) *ARPN Journal of Engineering and Applied Sciences*, 11 (1), pp. 356-361. Cited 6 times.
http://www.arpnjournals.org/jeas/research_papers/rp_2016/jeas_0116_3345.pdf

2 Rahman, T., Motakabber, S.M.A., Ibrahimy, M.I.
Low Noise Inverter for Poly Phase Microgrid System

(2016) *Proceedings - 6th International Conference on Computer and Communication Engineering: Innovative Technologies to Serve Humanity, ICCCE 2016*, art. no. 7808304, pp. 172-176. Cited 7 times.
ISBN: 978-150902427-8
doi: 10.1109/ICCCE.2016.46

View at Publisher

3 Rahman, T., Motakabber, S.M.A., Ibrahimy, M.I.
Design of a Switching Mode Three Phase Inverter

(2016) *Proceedings - 6th International Conference on Computer and Communication Engineering: Innovative Technologies to Serve Humanity, ICCCE 2016*, art. no. 7808301, pp. 155-160. Cited 11 times.
ISBN: 978-150902427-8
doi: 10.1109/ICCCE.2016.43

View at Publisher

4 Zhou, B., Liu, Q.
Input delay compensation for neutral type time-delay systems

(2017) *Automatica*, 78, pp. 309-319. Cited 17 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/270/description#description
doi: 10.1016/j.automatica.2016.12.015

View at Publisher

5 Lee, S.S., Heng, Y.E.
Improved Single-Phase Split-Source Inverter with Hybrid Quasi-Sinusoidal and Constant PWM

(2017) *IEEE Transactions on Industrial Electronics*, 64 (3), art. no. 7733058, pp. 2024-2031. Cited 24 times.
http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5410131
doi: 10.1109/TIE.2016.2624724

View at Publisher